



International Conference on Education & Educational Psychology 2013 (ICEEPSY 2013)

Transversal learning through music in the teaching profession

Kaarina Marjanen^{a*}, Markus Cslovjecssek^b

^aUniversity of Eastern Finland (UEF), School of Applied Educational Science and Teacher Education, Tulliportinkatu 1, 80101 Joensuu, Finland

^bUniversity of Applied Sciences North Western Switzerland (FHNW), School of Teacher Education, Kasernenstrasse 20, CH 5000 Aarau, Switzerland

Abstract

The surface shared by music and languages was observed in the European Music Portfolio project (2009-2012; <http://www.emportfolio.eu>), the aim of which was to support teachers in their profession, by combining theories with methodology and practices. One of the tools developed was the international CPD course for teachers. The success of these courses was measured in an e-questionnaire that was addressed to the participating teachers. One of the most interesting results reported, was a better focus on the learning processes of children due to the experiences of integrating music and languages. How can this valuable information benefit the development of initial teacher education?

© 2013 The Authors. Published by Elsevier Ltd.

Selection and peer-review under responsibility of Cognitive-counselling, research and conference services (c-crcs).

Keywords: curricula; learning; music; teacher training; teaching

1. Introduction

Music makes it possible to create and affect the atmosphere. Musical integration and learning processes are connected with emotional, bodily and cognitive factors that are already present and have started prenatally; also there is a connection to the positive atmosphere of the child's growth environment (Marjanen, 2009). All humans enter a world that comprises of two distinct sound systems, linguistic - including vowels, consonants and pitch contrasts of the native tongue, and musical - including timbres and pitches characteristic of the musical culture in question (Patel, 2008). In praxial music education (Elliott, 1995), musical experiences are understood to support learning when being actively involved in music making processes. Musical learning seems to be functioning in relation with transversal integration processes constructed through both internal, individual processes, and external social integration processes, also because of the impact of musical sounds (Cslovjecssek/Zulauf, in press;

* Corresponding author. Tel.: +358 50 5277 170; fax: +358 13 251 3564

E-mail address: kaarina.marjanen@uef.fi

Marjanen, 2012). This creates the surface for the present study approach, observed from the views of 1) The EMP-L project, and 2) the pilot study on international EMP-L based CPD courses for teachers (2012-2013).

2. Theoretical background

2.1. Focusing on the integration of music and languages

Music education has the ability to build bridges between the bodily, emotional and cognitive experiences which are to be combined in the limbic system of the brain (Hannaford, 2004). Music affects the brain and supports the long-term memory (Huotilainen, 2011; Overly, 1998). The new understanding of language education in the European Language Portfolio (<http://www.kielisalkku.edu.fi/fi>) is constructed on the holistic idea of learning and the human need for communication; this is shared with the idea of holistic music education as a basis for the EMP-L project. Understanding about how transversal learning affects integrated teaching methodology, is important for the reconstruction of this comprehension in order to serve the development of curricula and teaching methods. The understanding of the shared elements of music and languages is described in Fig. 1 below.

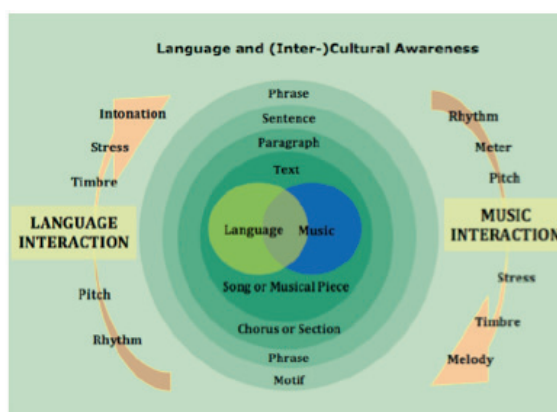


Fig. 1 Graphics to show the similar elements and structures of music and languages, as described in the Teacher's Handbook (<http://www.emportfolio.eu>)

Language and music both constitute complementary components for the human context of communication (Cross, 2008). The value of music, according to Blacking (1973), lies in the value of music itself. It serves many different purposes, living within people and as a part of their cultures through the connections between perception and expression. The decision to experience something perceived as music (i.e. silence, traffic noise, birds' song, language, movement, sequence of numbers), is up to the listener himself. In the traditions of music education, music has been constructed on the idea of musical learning and the development of musical skills, to learn about composers, music history and theory etc. When creating music education to serve future educational needs based on the awareness of musical impacts on human behavior and learning, it is important to approach music from a wider perspective. Musical vibration means energy. We hear pitches (in the frequency range 20 – 20 000 Hz), different timbres (harmonies), loudness (from auditory threshold to the threshold of pain), temporal structures (pulse, rhythm, meter, form) and harmonies (consonance – dissonance). In a professional understanding, it is phenomenal for the teacher to maintain an open definition of music, also to support open definitions of language

and musical integration. The fact that we start our lives surrounded with sounds that affect our holistic ways of being, can perhaps support one's ideas regarding the development of teaching methodology.

2.2. Teachers' professional development

Within the criteria of in-service teacher education (Reusser, 2011; Timperly, 2008; Reusser & Tremp, 2008 and Lipowsky, 2004), certain qualities and factors are set for this to be effective:

- focusing on teaching in relation to the school context
- connecting to the classroom situation and the teaching experience of the CPD-participants
- clear aims and defined methodological-pedagogical focus
- focusing on the curricular, subject content and the current experience of CPD-participants
- focusing on pupils' learning issues and the understanding of content-specific processes
- co-constructive and dialogue-based framework and methods
- transfer-orientation in design, ideally a combination of phases of input, training, transfer, realization, reflection and assessment
- creating motivation for co-operation, collaboration and dissemination within and beyond the school
- offering the option of support services
- creating motivation for deep reflection: teacher's professional habits, pupils' learning processes.

In order to find answers to the set questions, this framework and information, complemented with other theories, was used for the development of the questionnaire, and as a basis of the semi-structured interviews.

Many other theories on teachers' professional development, expertise and wellbeing at work (e.g. Rasehorn, 2009; Marjanen, 2005; Hämäläinen, 1996; Elliott, 1995; Dreyfus & Dreyfus, 1984; Rantalaiho, 1994; Ruismäki, 1991) were supported and complemented by learning theories and philosophies. In particular, Hannaford (2004) and Damasio (2001), supported study results on learning (Huotilainen, 2011) and musical interaction as a part of learning (Marjanen, 2009). These can be used to construct and fulfill understanding of the phenomena observed.

According to the CoT –project ([http://projectzero.gse.harvard.edu/assets/Final_Revised%20PZ_Brochure\(1\).pdf](http://projectzero.gse.harvard.edu/assets/Final_Revised%20PZ_Brochure(1).pdf)), teachers are striving to create a culture of thinking and pondering on various subjects. This is a departure from traditional forms of professional development that target specific subject areas or levels. Teacher's professional development must be supported by a rich professional culture. Transversal learning in affecting integrated teaching methodology is important for the reconstruction of comprehension. A pilot study was performed in 2012-2013 to understand the professional development and learning processes described above, with their reference to the present focus on music, languages and integration. We will now move on to look at the study.

3. Research methodology

The aim of this pilot study was not only to support our ideas in creating actual study procedure, but to increase our general understanding of the discourse of effective initial teacher training and professional development of teachers, especially concerning the implementation of didactic innovations in the field of music and language education. How could initial teacher training be developed to learn from the experiences of music and language integration – what were the teachers telling us? Was there a connection between the understanding of music/language integration and transversal learning/integrated teaching processes?

In 2012, a group of European teachers (N=108) participated in the pilot study on international EMP CPD courses (Germany; England, UK; Catalonia, Spain, Switzerland and Greece) which was supported by the European Music Portfolio (EMP-L) project (2009-2012, <http://www.emportfolio.eu>). This paper, based on the results of the pilot study, creates a basic understanding for developing studying methods in initial teacher training, and introduces preliminary ideas for this process. Participant teachers' answers are observed in an e-

questionnaire, and these are interpreted and explained in semi-structured interviews by teacher trainers from Finland and Switzerland (N=3) who represent the fields of educational sciences, language, and music education.

3.1. The e-questionnaire

The e-questionnaire was constructed on the basis of the theories presented in paragraph 2. This post-course questionnaire was realized as an e-questionnaire by the University of Helsinki, using tools of the elomake.helsinki.fi, and was sent on 22.12.2012 to the participants of the EMP CPD courses in 2012 (Germany; England, UK; Catalonia, Spain and Switzerland N=108). The questionnaire was mostly constructed of Likert-scale questions, with some open questions to describe certain phenomena given. The questions included definitions of music, languages and integration, EMP-CPD deliverables, the effects of the courses apparent in daily teaching practices, general evaluation of the course, benefits of the course, and background information (gender; year of birth; nationality; participation in international and national CPDs; educational background; working experience; language and music skills).

Because of the inconvenient timing of the questionnaire, answers could not be received from participants on the Greek CPD-course (n=29), therefore this group was removed from the data. This brings the total answering percentage to 32,9%, based on the number of the questionnaires (N=79) sent, and answered by teachers from Germany, England, Scotland, Romania, Catalonia, France, Switzerland, Finland and other countries (Hungary, Bulgaria, Slovenia, Croatia). Most of the teachers defined themselves as being proficient, expert or competent teachers, when estimating their working experience in various age groups and regarding subject focus. Their educational background mostly related to music, languages and generalist teaching.

The questionnaire data was first analyzed in SPSS 17.0 and Microsoft Office Excel 2007, to get a general overview of it, despite it being small in size and of qualitative orientation. This analysis was used as a basis, firstly to discover the study focus through the results of the questionnaire and secondly, to specify the approach to be used in a more detailed way, complemented with qualitative understanding.

3.2. The semi-structured interviews

The purpose of the interviews was to expand the answers given in the questionnaire. Teacher training experts (N=3) were interviewed in March 2013, a specialist in music (HEP Lausanne CH), languages (UEF Joensuu FI) and educational sciences (PH/FHNW Solothurn, CH). As a basis for discussion, the core of the interview included the following main themes:

1. the changes which the respondents had described in the questionnaire relating to the course, concerning the meaning of memories, experienced activities and self-written notes, vs. the minor importance experienced in the form of written materials (Teacher's Handbook, National Booklets, Pupil's Portfolio, printed activities) and the understanding of this phenomenon when considering initial teacher education and the methods used
2. the expertise needed as a ground for integration; the meaning of integration in teaching and learning

The interviews were recorded on a HTC sound recording tool in amr-format, then saved on a mp3, to be transcribed partly for the most important sections and details. They were then saved on an excel template to be analyzed and compared to find the similarities and differences in the answers 1, 2 and 3. The teacher trainers interviewed, agreed on most of the themes, though some questions were approached from different viewpoints. One of the interviews was given in Finnish via Skype; the whole of this interview was then translated into English to enable the other researcher to understand what had been said. Classification of the reasons, as answers to our questions, was easy and clear to find.

4. Results

4.1. Step 1: the questionnaire

An all-around overview of the data showed that as a result of participation on the course, the teachers stated that they were more accessible, more interactive and more available for the children. They also told us that in their work they used their memories, their own notes from the course and the activities they had experienced. Conversely, they did not find the printed materials (Teacher's Handbook, Pupil's Portfolio and printed activities) to be so important. See Tables 1-6 for the details.

Table 1. Memories from the course, which later affected the teacher's work

Which of the materials did you use after the course? : After the course, I have used my memories

	Frequency	Percent	Valid Percent	Cumulative Percent
once	1	3,8	3,8	3,8
2-5 times	6	23,1	23,1	26,9
Valid I use them now and then	8	30,8	30,8	57,7
I use them continuously	11	42,3	42,3	100,0
Total	26	100,0	100,0	

Table 2. Experiences of the course activities affecting the teaching work after the course

Which of the materials did you use after the course? : After the course, I have used the activities learned during the c

	Frequency	Percent	Valid Percent	Cumulative Percent
never	1	3,8	3,8	3,8
once	1	3,8	3,8	7,7
Valid 2-5 times	9	34,6	34,6	42,3
I use them now and then	8	30,8	30,8	73,1
I use them continuously	7	26,9	26,9	100,0
Total	26	100,0	100,0	

Table 3. Course activities as a model to create ones own, to follow the idea

Which of the materials did you use after the course? : After the course, I have been developing my own activities based

	Frequency	Percent	Valid Percent	Cumulative Percent
never	2	7,7	7,7	7,7
once	4	15,4	15,4	23,1
Valid 2-5 times	3	11,5	11,5	34,6
I use them now and then	11	42,3	42,3	76,9
I use them continuously	6	23,1	23,1	100,0
Total	26	100,0	100,0	

Table 4. Teacher's Handbook as a support for the teaching after the course

Which of the materials did you use after the course? : After the course, I have used The Teacher's Handbook

	Frequency	Percent	Valid Percent	Cumulative Percent
never	6	23,1	23,1	23,1
once	8	30,8	30,8	53,8
Valid 2-5 times	5	19,2	19,2	73,1
I use them now and then	7	26,9	26,9	100,0
Total	26	100,0	100,0	

Table 5. National Booklets as a support for the teaching work after the course

Which of the materials did you use after the course? : After the course, I have used The Teacher's (National) Booklet

	Frequency	Percent	Valid Percent	Cumulative Percent
never	11	42,3	42,3	42,3
once	3	11,5	11,5	53,8
Valid 2-5 times	5	19,2	19,2	73,1
I use them now and then	5	19,2	19,2	92,3
I use them continuously	2	7,7	7,7	100,0
Total	26	100,0	100,0	

Table 6. EMP Pupil's portfolio as recourse for the teacher at school after the course

Which of the materials did you use after the course? : After the course, I have used pupil's portfolio

	Frequency	Percent	Valid Percent	Cumulative Percent
never	13	50,0	52,0	52,0
once	3	11,5	12,0	64,0
Valid 2-5 times	6	23,1	24,0	88,0
I use them now and then	2	7,7	8,0	96,0
I use them continuously	1	3,8	4,0	100,0
Total	25	96,2	100,0	
Missing System	1	3,8		
Total	26	100,0		

See also Table 7 (as Appendix A), as an example which points to the very significant*** correlations between the course, and behavior at work after the course. However, this result cannot be generalized because of the small size of the sample data. Some connections, as described by the teachers in the questionnaire, are suggested with reference to the understanding of music, languages and integration and are also connected to Hannaford's theory (2004).

Because of the very significant general level and high correlations, there would be evidence to further investigate the impacts of music as a part of the CPD-course, as well as music in teacher training. The table in the Appendix cannot be generalized, but it makes us stop and think. What makes a teacher more accessible to many things, and why? The answers to this are found in the questionnaire.

4.2. Step 2: the interviews

The purpose of the interviews was to open up the answers given in the questionnaire. Teacher training experts (N=3) were interviewed in March 2013, a specialist in music (HEP Lausanne CH), languages (UEF Joensuu, FI) and educational sciences (PH/FHNW Solothurn, CH). When interpreting the results of the questionnaire, teacher trainers said it was clear that as a result of the music-language integration, the focus and connection to learning processes became important. In the opinion of the teacher trainers interviewed, they clearly observed and supported a trend towards increasing projects and process-based learning rather than teaching being constructed in a subject-oriented way. The respondents saw this as an answer to increasing pupils' motivation at school and teacher students' motivation at universities, and did not see problems in starting the studies almost straightaway with integrative learning methods; they felt it would also be possible to learn the basics of certain subjects through this integration methodology. There were, however, some differences in how the ideas were presented and emphasized. The transformative power of the space opened up by the integration of the two disciplines, was clearly shown. Due to the musical activities, the emotional and social factors were strongly involved in the processes.

- *"Most important: how can children learn – in music, languages, then by combining them? This is the target: learning. What are the differences and similarities, how can we support them? One has to have an understanding about learning to be able to teach and motivate."*
... *"I'll find a way. If they have to write a thesis, I'll say to them, first you tell me about learning, then about music and languages, then about how you combine them, which strategy do you use for your learning, how can we integrate music and languages to progress...? It's not about discipline or mathematics, it's all about learning as a whole, e.g. projects... what is teaching, what is learning? All the teachers say the same. Pupils are very involved in these projects."* (Teacher trainer 1)
- *"The starting point is to understand the child's learning and growth, especially with young children, how can you make it work? Problem: in language training you only focus on the subject, which leads to focusing on one subject at a time, which is not good. It is not what life is. Instead of this isolated subject orientated thinking we should see them all together, as a whole, with connections to real life, a wider context of life. Different views complement each other and teachers are able to find them better after taking part in mutual discussions."* (Teacher trainer 2)
- *"I wonder if there are some learning processes that are interdisciplinary, are there differences between learning processes, is there one from music for example, and maybe there are theories about combining? We don't know anything about that and I don't know, that's why I'm looking for theories. What is going on in the heads of children? Is there a difference between learning processes? How do they learn? And it's not education, it's like... growth and development... so we have an idea, another person should have to combine perspectives."* (Teacher trainer 3)

4.3. Step 3: summarizing the results of the questionnaire and the interviews

As a whole, the information gained can be described through an interesting figure. Teaching music and languages as an integrated unity might have a chance to serve the purposes of learning and have a place in discussion on initial teacher training, in-service teacher training and in the field of school learning and teaching. What if we constructed our learning – not on subjects – but on learning processes? After the CPD-course, further information on these questions will be processed, based on the connections between the descriptions on music, language and integration, and experiences of them as a part of the teaching tasks at school.

The theories presented at the onset of the study, support the results gained from it. More attention should be directed towards the impacts of music with regard to its spirit and qualities, the methods used, and as a basis for understanding the learning processes. The actual study will help us to further develop the next steps of the investigation. When integrating subjects, we need specific data that relates to initial teacher education. See Fig. 2

below, a description of the ongoing process and the internal connections. It is claimed here that as a result of the integration of music and languages, the teachers' orientation towards the way children learn was found to be more important than earlier and this affected the teaching: through better integration, would there be a change in teaching which could help us to understand more about the transversal learning processes? This must be further clarified for us to gain a better and clearer understanding, which in turn, may help us in developing initial teacher education.

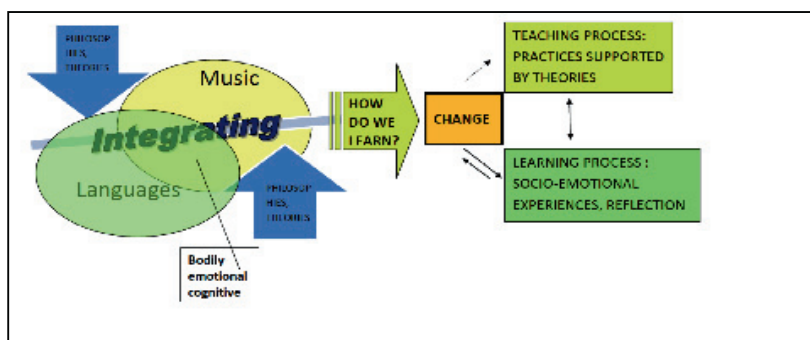


Fig. 2. Interpreting the results with the teacher trainers (N=3)

Previous information on the processes of professional development can be used as a framework for the specified information gained through this pilot study and to give guidelines for the mutual development of initial teacher training and in-service teacher training. How can we support the teaching profession in music, and through music? With the support of musical integration, how can we help the child to learn and develop, support the teacher in understanding these processes, as well as learning together? These questions are to be further solved in the actual study that is to be developed on the basis of the pilot study procedure and results.

5. Discussion

How can the data be understood correctly? What kind of information should be used, and how? In this pilot study, the quantitative tools were not used to give exact evidence for the results described, but to point out and grip onto some factors, following the lead already gained. The actual study will lean on a very qualitatively based understanding of the research through triangulation; it is also to be interpreted through tacit knowledge, the features of repeated and intertwined information, and through admitting the existence of gift-like knowledge created out of a trustworthy relationship between the researcher and the participant. Shared experiences may sometimes prevent the researcher from seeing things openly, but they also support him/her in understanding and interpreting the information given by the object of the study. Music and learning are both very abstract phenomena and it is a challenge to confront them also in the discourse of integrated teaching. There is strong evidence, however, on the impact of music on human behavior, growth and development, which is also supported by the pilot study information. In Chinese culture, music was formalized around 450 B.C.E. About 400 B.C.E., Plato asserted that vibration is the primary cosmic principle.

The Ethological Theory and the Relationship Approaches (Hinde 1997) along with the Musilanguage Theory (Brown, 2000), support the ideas of finding evidence for the impact of music to be directed to serve the development of teacher education. For these purposes, the data procedure will be further developed, to be able to repeat the study in several CPD participating groups and complement it with other study methods, to be performed both individually and in groups. Further information will also be gathered on what is happening during the courses.

6. Copyright

All authors must sign the Transfer of Copyright agreement before the article can be published. This transfer agreement enables Elsevier to protect the copyrighted material for the authors, but does not relinquish the authors' proprietary rights. The copyright transfer covers the exclusive rights to reproduce and distribute the article, including reprints, photographic reproductions, microfilm or any other reproductions of similar nature and translations. Authors are responsible for obtaining from the copyright holder, permission to reproduce any figures for which copyright exists.

Acknowledgements

A special “thank you” goes to the European Music Portfolio project team and the teachers that participated in this pilot study.

References

- Blacking, J. (1973). *How Musical is Man?* Seattle, WA: University of Washington Press.
- Brown, S. (2000) The “Musilanguage” model of music. In N.L. Wallin, B. Merker & S. Brown (eds.) *The origins of music*. London: The MIT Press, 271 - 300.
- Cross, I. (2008). Musicality and the human capacity for culture. *Musicae Scientiae*, Special Issue: *Narrative in music and interaction*, 147-167.
- Cslovjecssek, M., & Zulauf, M. (Eds). (in press). *Integrated Music Education. Challenges for Teaching and Teacher Training*. Bern: Peter Lang Editors
- Elliott, D. (1995). *Music matters: A new philosophy of music education*. New York: Oxford University Press.
- Hannaford, C. (2004) *Viisaat liikkeit – aivojumpalla apua oppimiseen* Originally 1995: Smart moves, why learning is not all in your head. A Finnish edition (S. ed.). Helsinki: Hakapaino Oy.
- Hinde, R.A. (1997) Hinde, R.A. (1997). Etologinen teoria ja suhdeteoria. (The ethological theory and the relationships approaches.) In Ross Vasta (ed.) *Kuusi teorioita lapsen kehityksestä*. (Six theories of a child's development.) (pp. 289 – 320). Kuopio: Kuopion yliopiston painatuskeskus.
- Huotilainen, M. (2011). Greetings from brain research – music education is important for brain development. *Proceedings of the 5th Conference of the European Network of Music Educators and Researchers of Young Children*. Helsinki, Finland.
- Lipowsky, F. (2004). Was macht Fortbildungen für Lehrkräfte erfolgreich? Befunde der Forschung und mögliche Konsequenzen für die Praxis. *Die Deutsche Schule*, 96(4), 462–479.
- Marjanen, K. (2009). *The Belly-Button Chord. Connections of Pre- and Postnatal Music Education with early Mother-Child Interaction*. University of Jyväskylä, Finland. Jyväskylä Studies in Humanities, 130. Dissertation. Retrieable in <http://urn.fi/URN:ISBN:978-951-39-3769-0>
- Marjanen, K. (2012). Pre- and postnatal music education for holistic development and communicative well-being. In Niland, A, & Rutkowski, J. (eds). *15th Early Childhood Music Education (ECME) proceedings*: International seminar, 9-13 July 2012, Corfu, Grece, 70-74.
- Overy, K. (1998). Can music really ‘improve’ the mind? *Psychology of Music*, 26(1): 97–99.
- Patel, A. (2008). *Music, language and the brain*. Oxford University Press: New York
- Reusser, K., & Tremp, P. (2008). Diskussionsfeld "Berufliche Weiterbildung von Lehrpersonen". *Beiträge zur Lehrerbildung*, 26(1), 5–10.
- Reusser, K. (2011). Von der Unterrichtsforschung zur Unterrichtsentwicklung – Probleme, Strategien, Werkzeuge. In W. Einsiedler (Ed.), *Unterrichtsentwicklung und didaktische Entwicklungsforschung*, 11–40. Bad Heilbrunn, Germany: Klinkhardt.
- Timperley, H. (2008). *Teacher professional learning and development*. Brussels & Geneva: International Academy of Education & International Bureau of Education.

Appendix A.

Table 7. Correlations: CPD course participation vs. changes at work.

Correlations									
		Because of the participation in the EMP-L course, there was a change in my: attitudes and motivation to teach in general	Because of the participation in the EMP-L course, there was a change in my: listening to children's reactions, being ope	Because of the participation in the EMP- L course, there was a change in my: way of linking sounds and games	Because of the participation in the EMP-L course, there was a change in my: being open to music	Because of the participation in the EMP-L course, there was a change in my: being open to languages			
: International CPD course country	Pearson	.146	.130	.123	.221	.157			
	Correlation								
	Sig. (2- tailed)	.651	.687	.702	.489	.626			
	N	12	12	12	12	12			
Because of the participation in the EMP-L course, there was a change in my: attitudes and motivation to teach in general	Pearson	1	.834**	.620**	.623**	.882**			
	Correlation								
	Sig. (2- tailed)		.000	.014	.013	.000			
	N	12	15	15	15	15			
Because of the participation in the EMP-L course, there was a change in my: listening to children's reactions, being ope	Pearson	.834**	1	.762**	.670**	.934**			
	Correlation								
	Sig. (2- tailed)	.000		.001	.006	.000			
	N	12	15	15	15	15			
Because of the participation in the EMP-L course, there was a change in my: way of linking sounds and games	Pearson	.620*	.762**	1	.588*	.766**			
	Correlation								
	Sig. (2- tailed)	.014	.001		.021	.001			
	N	12	15	15	15	15			
Because of the participation in the EMP-L course, there was a change in my: being open to music	Pearson	.623*	.670**	.588*	1	.844**			
	Correlation								
	Sig. (2- tailed)	.013	.006	.021		.000			
	N	12	15	15	15	15			
Because of the participation in the EMP-L course, there was a change in my: being open to languages	Pearson	.882**	.934**	.766**	.844**	1			
	Correlation								
	Sig. (2- tailed)	.000	.000	.001	.000	.000			
	N	12	15	15	15	15			

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

**.

Correlation is significant at the 0.01 level (2-tailed).

*.

Correlation is significant at the 0.05 level (2-tailed).